

REMARKS

Abstract

The abstract of the disclosure has been objected to because it is more than 150 words. Applicants appreciate the Examiner's observations and have amended the abstract to address the Examiner's concerns.

Specification

The Specification has been objected to because of the following informalities. Appropriate correction is required. The Examiner in the Office Action states:

“Specification pages 5-6 contain blank spaces for potentially issued patent numbers of patent applications. The first application has issued as US patent 6,735,489. The second has not yet issued.”

“Specification page 19 states “The master process model 20, logically, is a child of the reference set 26 and virtual blank 10”. FIG 5 and FIG 8 state “REFERENCE SET OF GEOMETRY”. Please discuss and define “reference set 26”. Also, the figures do not appear to display a parent/child association between said reference set 26 and said master process model 20, please clarify. Note the related discussion of the term “horizontal” in the Claim Interpretation section below.”

Applicants appreciate the Examiner's observations regarding the specification. Paragraph 5 of page 5 has been amended to address the Examiner's concerns. Further Applicant directs the Examiner's attention to the Preliminary Amendment filed June 20, 2002. With regard to the specification at page 19, the reference set of a geometry is a well known term in the CAD/CAM arts comprising essentially a “copy” of the geometric features of a product model without necessarily incorporating the entire model. This is a convenient methodology of formulating a link to a horizontally structured product model. See Solid Edge Users guide V8, page 377 regarding an associative copy. Horizontal modeling is taught by commonly assigned patent application 09/483,301, which the Examiner is also examining. Further, to clarify the specification, the virtual blank 10 has an associative relationship with the reference set 26, while the master process model exhibits an associative relationship with the virtual blank 10. There is no requirement that the master process model exhibit a direct associative relationship with the reference set 26.

Paragraph 3 of page 19 has been amended to clarify this distinction and address the Examiner's concerns.

Knowledge Based Expert Systems

Applicants have no comments regarding the Examiner's references to Expert based systems.

Claim Disposition

Claims 1 – 187 are pending in the application. Claims 1 – 187 have been rejected. Claims TBD have been amended.

Claim Rejections - 35 USC § 101

Claims 153-187 stand rejected under 35 U.S.C. 101 as allegedly the claimed invention is directed to non-statutory subject matter. The Examiner in the Office Action states:

Specifically the claims are directed towards "computer data signal". Said computer data signals appear to be electromagnetic signals (such as voltages containing binary data), and are not statutory subject matter.

Applicants appreciate the Examiner's observations and have amended claim 153 to employ a more commonly accepted form of a propagated signal claim to address the Examiner's concerns. The Examiner's attention is directed to note similar language is employed in Claim 119 regarding the Storage medium claim.

Claim Rejections - 35 USC §112 - first paragraph

Claims 1-187 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one

skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants respectfully traverse. The Examiner states in the Office Action:

“The claim 1 term “capturing manufacturing process rules in a spread sheet” is not enabled. The specification does not adequately enable a knowledge based expert system consisting of manufacturing process rules from machining handbooks and from experience of expert operators.”

“For example, note that Chu page 1 states “all necessary information that drives the NC machine... two main categories geometric data and technical data. The technical data are generally determined with the aid of machining hand books or according to the machining experience of operators; it includes tool selection, arrangement of machining sequences and decision of cutting parameters. After those data have been decided, geometric information such as cutter location data in every tool pass can be obtained. CAD/CAM systems provide the possibility to generate necessary information of NC programs directly from the CAD model of a workpiece”. Emphasis added.”

“Chu page 20 also states “Data transfer between models and communication of separate NC functions need further investigation” and “it is possible to embed the proposed NC planning functions into the next generation machine tool controller to offer a crucial link between planning and fabrication during rapid-manufacturing by machining. This work provides a systematic description of these function requirement”. Note that Chu is dated 2/22/2002, which is after the present applications claimed priority date of 3/14/2001.”

“Thus, even though Chu is later than the present application, Chu still uses words indicating lack of enablement: like “need further investigation” and “next generation machine tool controller” at page 20, and “critical points that remain deficient in using CAD/CAM systems on NC programming... Important tasks are as follows” at page 17.”

“See above discussion of knowledge based expert systems for additional details. Note the difficulty of capturing expert knowledge such as “machining experience of operators”.”

“Also in claim 1, the term “generating machining instructions” is similarly not enabled.”

“Claims 2-187 are not enabled for the same reasons as claim 1.”

Applicants appreciate the Examiner's observations, but respectfully contend that the Examiner is mischaracterizing the claimed invention. Applicants are not claiming a knowledge based system as the Examiner suggest. Applicants are providing a means of automating the manufacturing process by integrating the generation of manufacturing process sheets (instructions) with the master process model. In the way, when modifications are established in one, the changes are automatically flowed to the others. The existing art includes no linking between the manufacturing environment and the modeling environment. Applicants respectfully direct the Examiner's attention to the Specification pages 49 – 55, and particularly to pages 52 and 53.

35 USC § 112-Second Paragraph

Claims 1-187 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse. The Examiner in the Office Action states:

“The claim 1 term ‘associative relationship’ is indefinite.”

“Note that said term occurs twice in claim 1, and appears to have different meanings: “said manufacturing feature exhibiting an associative relationship with said coordinate system” and “said spread sheet exhibiting another associative relationship with said master process model. The first relationship is positional (geometric), but the second relationship is not positional.”

“The claim 2 term “said associative relationship” is indefinite. Note that there are distinct associative relationships in parent claim 1, and it is not clear which associative relationship from claim 1 is being further limited in claim 2.”

“Claims 3-187 are indefinite for the same reasons as claim 1.”

“Additionally, in claim 16 and 35, the term “reference set geometry is defined by dimensional characteristics of a modeled part” is indefinite. Specification page 19 states “The master process model 20, logically, is a child of the reference set 26 and virtual blank 10”. FIG 5 and FIG 8 state “REFERENCE SET OF GEOMETRY”. The specification does not adequately discuss or define “reference set 26”. Also, the figures do not

appear to display a parent/child association between said reference set 26 and said master process model 20, please clarify. Note the related discussion of the term ‘horizontal’ in the Claim Interpretation section below.”

With regard to Claim 1, Applicants respectfully contend that the Examiner is mischaracterizing the claim. Claim 1 recites two associative relationships: “an associative relationship” and “another associative relationship”. This terminology is not indefinite. The Examiner is correct that one of the associative relationships may be positional (or placement) while the other is most likely not positional. An associative relationship merely indicates that there is a link of some sort. It need not be so narrowly interpreted as being positional only.

With regard to Claim 2, Applicants respectfully contend that the Examiner is mischaracterizing the claim. Claim 1 recites two associative relationships: “an associative relationship” and “another associative relationship”. Claim 2 refers to “an associative relationship”. The Examiner’s attention is directed to note that Claim 23 provides the same limitation regarding the “another associative relationship” of Claim 1.

With regard to Claims 16 and 35, Applicants respectfully disagree. Applicants direct the Examiner’s attention to note that in the specification at page 19, the reference set of a geometry is a well known term in the CAD/CAM arts comprising essentially a “copy” of the geometric features of a product model without necessarily incorporating the entire model. This is a convenient methodology of formulating a link to a horizontally structured product model. See Solid Edge Users guide V8, page 377 regarding an associative copy. Further, to clarify the specification, the virtual blank 10 has an associative relationship with the reference set 26, while the master process model exhibits an associative relationship with the virtual blank 10. There is no requirement that the master process model exhibit a direct associative relationship with the reference set 26. Paragraph 3 of page 19 has been amended to clarify this distinction and address the Examiner’s concerns.

Claim Interpretation

The claim language is interpreted in light of the specification. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. The Examiner states in the Office Action:

“In claim 1, the preamble term “horizontally structured CAD/CAM” is given little weight, and is not interpreted as a claim limitation. There appear to be at least 2 possible and very different meanings of the term “horizontal”.”

“First, regarding modeling the virtual blank, the term “horizontal tree structure” is defined at page 4 as “preferably by establishing an exclusive parent/child relationship between a set of reference planes and each feature”. However, features having additional features as children are not expressly excluded. Further, specification page 10 expressly allows features to have children: “certain form features may be preferably dependent from other form features or model elements rather than directly dependent as children from the 3-D coordinate system.... For example, and edge blend... the intent being to keep the lineage as short as possible If the term “lineage as short as possible were given weight as a claim limitation, then it would be indefinite Also, see “additional datum planes” at specification page 10.”

“Second, regarding virtual machining, the specification page 17 states “generating process sheets.... add via virtual machining... manufacturing features (12a-12j) to the virtual blank 10 in a horizontally-structured manner”. In this context, “horizontally” appears to mean sequentially in time, per specification page 17 that states “snapshot” of “the assembly of the master process model 20 in progress, showing all of the manufacturing features I 2a—I 2j up to that operation in the assembly, but none that come after it.” See above discussion of “associative relationship” in the indefiniteness rejections of claims 1 and 2.”

“In claim 9, the term “extract” is interpreted as a “snapshot” of the assembly of the master process model in progress, per specification page 17.”

“Said interpretations are maintained throughout the claims.”

Applicants respectfully submit that the Examiner's first interpretation based upon the language of page 4 is accurate but, unnecessarily to narrow. The objective of horizontal modeling is to avoid the establishment of associative relationships with the base feature as commonly employed in the "vertical" modeling of the prior art. It does not however mean, nor have the Applicants ever indicated that no instances of associative relationships between features is allowed. In fact, Applicants specifically identified specific examples e.g., blends, chamfers, where this would not be the case. The Examiner's interpretation regarding the term "extract" is accurate, except to note that the snap shot is also a model, therefore the notation of in-process model.

Claim Rejections - 35 USC § 103

Claims 1-187 stand rejected under 35 U.S.C. 103(a) as being unpatentable over: Freilich U.S. Patent No. 6,599,125, hereinafter referred to as Freilich; in view of Solid Edge User's Guide Version 6, hereinafter referred to as the User's Guide; and in further view of Integrated Solid Modeler based Solutions For Machining A. D. Spence, hereinafter referred to as Spence Applicants respectfully traverse. The Examiner states:

"Independent claim 1 is "method" claim with 9 limitations, numbered by the Examiner for clarity.

"[1]-“selecting a blank for machining into an actual part” is disclosed by Freilich column 8 line 40 “The component is preferably in the form of a block (also known as a blank) for CAD/CAMming purposes.”

"[7]- “generating machining instructions to create said actual part by machining said manufacturing feature into said blank” is Freilich column 8 line 40 “The component is preferably in the form of a block (also known as a blank) for CAD/CAMming purposes.”

"The additional limitations are not explicitly disclosed by Freihich."

"[2]- “establishing a coordinate system” is disclosed by Solid Edge V6 page 96 “The types of reference planes are base, global, and local....”"

“[3]- “creating a master process model comprising: a virtual blank corresponding to said blank...” is disclosed by Freilich column 8 line 40 “The component is preferably in the form of a block (also known as a blank) for CAD/CAMming purposes.” Note that CAD (Computer Aided Design) implies that actual physical structural blank has a virtual counterpart which is used for CAM (Computer Aided Machining).”

“[4]- “a manufacturing feature” is disclosed by Solid Edge V6 page 33 “Solid Edge provides protrusion and rib commands to add material, and cutout and hole commands to remove material.””

“[5]- “virtual machining of said manufacturing feature into said virtual blank” is disclosed by Solid Edge V6 page 33 “Solid Edge provides protrusion and rib commands to add material, and cutout and hole commands to remove material” and page 28 “complete the model by adding material to (B) or removing material from (C) the previous features”. And also implicitly disclosed by Freilich column 8 line 40 “The component is preferably in the form of a block (also known as a blank) for CAD/CAMming purposes” and column 2 line 18 “further modified, for example by cutting, carving”.”

“[6]- “said manufacturing feature exhibiting an associative relationship with said coordinate system” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local.” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent....”.”

“[8]- “capturing manufacturing process rules in a spread sheet” is disclosed by Solid Edge V6 pages 221 “Operation Navigation Tool (ONT)” and page 222-223 for examples of spreadsheets, and Spence FIG 2.”

“[9]- “said spread sheet exhibiting another associative relationship with said master process model” is disclosed by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modeling kernel”. Note that Spence’s “solid modeling kernel” is equivalent to Freilich’s CAD system, and exemplified by Solid Edge V6. Additionally, note that Spence’s “physical machining” is equivalent to Freilich’s CAM. Thus, Freilich term “CAD/CAMming” is implicitly teaching towards the integration of CAD and CAM, as expressly discussed in Spence.”

“At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Solid Edge V6 and Spence to modify Freilich. Starting with Freilich’s broad discussion of “CAD/CAMming”, one of ordinary skill would have looked to Solid Edge V6 for a standard CAD engine (or “solid modeling kernel” in Spence’s terminology) and standard techniques for modeling the construction blanks, and the desired dental devices. Further, one of ordinary skill in the art would have looked to Spence to save time and money by automating the complex and labor intensive physical machining process for the complex curves and complex voids in dental devices. Spence abstract uses the terminology “developing a comprehensive physical machining process based on a sold modeling kernel”. Additionally, note that Freilich recognizes and implicitly teaches toward the union and merging of CAD and CAM by using the term “CAD/CAMming.”

“In claims 2, 4, 6, 8, 12, 23, 24, 25, 26, 27, 31, 43, 45, 46, 51, 52, 53, 54, 56, 57, 58, and 59 “associative relationship” is disclosed by Solid Edge V6 page 178 “To fully control one part in relation to other parts in an assembly, you must use a combination of assembly relationships. There is often more than one way to apply relationships that will position a part correctly. It is important to choose the way that best captures design intent, because this makes your assembly easier to understand and edit.” Note that one of ordinary skill in the art would interpret Solid Edge broadly as disclosing common types of associative relationships, including parent/child relationships.”

“In claim 3 “another manufacturing feature exhibiting an associative relationship with said manufacturing feature” is disclosed by Solid Edge V6 page 178 “To fully control one part in relation to other parts in an assembly, you must use a combination of assembly relationships. There is often more than one way to apply relationships that will position a part correctly. It is important to choose the way that best captures design intent, because this makes your assembly easier to understand and edit.” For example, a hole may be a first manufacturing feature, and internal threads in the hole may be a second associated manufacturing feature. The related CAM actions would be drilling said hole, and cutting said threads.”

“In claim 5, “virtual blank exhibits an associative relationship with another said manufacturing feature” is disclosed by Solid Edge V6 page 178 “To fully control one part in relation to other parts in an assembly, you must use a combination of assembly relationships. There is often more than one way to apply relationships that will position a part correctly. It is important to choose the way that best captures design intent, because this makes your assembly easier to understand and edit.”.

“In claim 7, “said virtual blank exhibits an associative relationship with said coordinate system” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent...”.”

“In claim 9 and 28, “creating extracts from said master process model” is disclosed by Solid Edge V6 page 90 “feature construction process”, and also see Applicant’s discussion at specification page 17 “In Unigraphics ® software, a Modeling Module includes software configured to handle the extraction process” and “snapshot” and “of the assembly of the master process model 20 in progress.”.”

“In claim 10 and 29, “extracts comprise replicated models of said master process model at various operations of said manufacturing” is disclosed by Solid Edge V6 page 90 “feature construction process”, and Applicant’s admission at specification page 17 “In Unigraphics ® software, a Modeling Module includes software configured to handle the extraction process” and “snapshot” and “of the master process model 20 in progress.”.”

“In claim 11 and 30. “extracts exhibit an associative relationship with said master process model” is disclosed by Solid Edge V6 page 90 “feature construction process”, and also see Applicant’s discussion at specification page 17 “In Unigraphics ® software, a Modeling Module includes software configured to handle the extraction process” and “snapshot” and “of the assembly of the master process model 20 in progress.”.”

“In claim 13 and 32, “said extracts are used to generate manufacturing process sheets” is disclosed by Solid Edge V6 page 90 “feature construction process”, and also see Applicant’s discussion at specification page 17 “In Unigraphics ® software, a Modeling Module includes software configured to handle the extraction process” and “snapshot” and “of the assembly of the master process model 20 in progress”. Note that Spence’s “solid modeling kernel” is equivalent to Freilich’s CAD system, and exemplified by Solid Edge V6. Additionally, note that Spence’s “physical machining” is equivalent to Freilich’s CAM. Thus, Freilich term “CAD/CAMming” is implicitly teaching towards the integration of CAD and CAM, as expressly discussed in Spence.”

“In claim 14 and 33, “said virtual blank is positioned and oriented relative to said coordinate system” is disclosed by Solid Edge V6 page 29

“Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent....”.”

“In claim 15 and 34, “said virtual blank is generated as a three dimensional parametric solid model from a reference set of geometry” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent....”.”

“In claim 16 and 35, “reference set geometry is defined by dimensional characteristics of a modeled part” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features.. Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local ...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent...”.”

“In claim 17 and 36, “establishing said coordinate system comprises one or more datum planes” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent...”.”

“In claim 18 and 37, “a first datum plane positioned and oriented relative to a reference” and “second datum plane positioned and oriented relative to said reference” and “third datum plane positioned and oriented relative to said reference” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you

place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent...”.”

“In claim 19 and 38, “said first datum plane, said second datum plane, an said third datum plane are orthogonal” is disclosed by Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves--as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent...”.”

“In claims 20 and 39, “said manufacturing instructions comprise process sheets” is disclosed by Solid Edge V6 page 90 “feature construction process” and by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modeling kernel”. Note that Spence’s “solid modeling kernel” is equivalent to Freilich’s CAD system, and exemplified by Solid Edge V6.”

“In claims 21 and 40, “said process sheets are linked with numerically controlled tools and a coordinate measuring machine” is disclosed by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modlling kernel” and page 553 “Computer Numerical Control” and Freilich column 8 line 49 “scanning device”. Note that Spence’s “solid modeling kernel” is equivalent to Freilich’s CAD system, and exemplified by Solid Edge V6.”

“In claims 22 and 41, “said master process model is linked with numerically controlled tools and a coordinate measuring machine” is disclosed by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modeling kernel” and page 553 “Computer Numerical Control” and Freilich column 8 line 49 “scanning device”.”

“In claims 42 and 44, “modifying a link among a plurality of modeling elements” is disclosed by Solid Edge V6 page 178 “Capturing Design Intent.... make minor design modifications and observe how parts in your assembly react. If the assembly does not behave as you expect, you can delete the relationships and reapply them using a different approach... gives you the behavior you want when design modifications are made.”.”

“In claim 47, “removing said link among said modeling elements” is disclosed by Solid Edge V6 page 178 “Capturing Design Intent... make minor design modifications and observe how parts in your assembly react.

If the assembly does not behave as you expect, you can delete the relationships and reapply them using a different approach ...gives you the behavior you want when design modifications are made.”

“In claim 48, “establishing said link among said modeling elements” is disclosed by Solid Edge V6 page 178 “Capturing Design Intent... make minor design modifications and observe how parts in your assembly react. If the assembly does not behave as you expect, you can delete the relationships and reapply them using a different approach... gives you the behavior you want when design modifications are made.”.”

“In claim 49, “substituting a second plurality of modeling elements for said plurality of modeling elements” is disclosed by Solid Edge V6 page 178 “Capturing Design Intent.... make minor design modifications and observe how parts in your assembly react. If the assembly does not behave as you expect, you can delete the relationships and reapply them using a different approach... gives you the behavior you want when design modifications are made.”.”

“In claim 50, 55, “said extracts are linked with numerically controlled tools and a coordinate measuring device” is disclosed by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modeling kernel” and page 553 “Computer Numerical Control” and Freilich column 8 line 49 ‘scanning device’.”

“MOTIVATION FOR CLAIMS 2-59. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use Solid Edge V6 and Spence to modify Freilich. Starting with Freilich’s broad discussion of “CAD/CAMming”, one of ordinary skill would have looked to Solid Edge V6 for a standard CAD engine (or “solid modeling kernel” in Spence’s terminology) and standard techniques for modeling the construction blanks, and the desired dental devices. Further, one of ordinary skill in the art would have looked to Spence to save time and money by automating the complex and labor intensive physical machining process for the complex curves and complex voids in dental devices. Spence abstract uses the terminology “developing a comprehensive physical machining process based on a sold modeling kernel”. Additionally, note that Freilich recognizes and implicitly teaches toward the union and merging of CAD and CAM by using the term “CAD/CAMming”.”

“Claims 60-118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freilich in view of Solid Edge V6 and Spence.”

“Claims 60-118 are “manufactured part created by the method” claims, with the same imitations “method” claims 1-59, and thus are rejected for the same reasons as claims 1-59.”

“Note that the prior art discloses the limitations of the “method” claims, and similarly implicitly discloses the “manufactured part created by the method”.”

Additionally, note that claim 1 (“method” according to preamble) and claim 60 (“manufactured part created by the method” according to preamble) appear to have identical limitations, and differ only by the designation of 35 USC 101 statutory categories stated in their respective preambles.”

“Claims 119-152 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freilich in view of Solid Edge V6 and Spence.”

“Claims 119-152 are “storage medium” claims, with the same limitations “method” claims 1-59, and are rejected for the same reasons.”

“Claims 153-187 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freilich in view of Solid Edge V6 and Spence.”

“Claims 153-187 are “computer data signal” claims, with the same limitations “method” claims 1-59, and are rejected for the same reasons.”

Applicants respectfully contend that explanation in the Office Action mischaracterizes the teachings of Freilich, User’s Guide, and/or Spence and that the cited references do not teach or disclose each element of the invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q.

494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

With regard to Claims 1, 60, 119, and 153, Applicant respectfully contends that neither Freilich, the User's Guide, nor Spence teach or disclose each element of the invention. Specifically, as enumerated by the Examiner, neither Freilich, the User's Guide, nor Spence teach or disclose, item [7] "generating machining instructions to create said actual part by machining said manufacturing feature into said blank". Contrary to the Examiner's assertions, Col. 8, line 40 of Freilich only addresses the blank, there is no teaching with respect to machining instructions or generating the machining instructions.

Moreover, neither Freilich, the User's Guide, nor Spence does not teach or disclose, [8] "capturing manufacturing process rules in a spread sheet". To support the rejection the Examiner relies on pages 221 "Operation Navigation Tool (ONT)" and page 222-223 for examples of spreadsheets, and Spence FIG 2. However, Applicants respectfully contend that the Examiner has significantly mischaracterized the teachings of the User's Guide at pages 221 – 223. The User's Guide at pages 221 – 223 merely discloses references to **drawing** sheets, there is absolutely no disclosure of an Operation Navigation Tool nor a spreadsheet. There is no disclosure what so ever regarding capturing manufacturing process rules in a spreadsheet, nor integrating a spreadsheet with the master process model.

Furthermore, with regard to [9] "said spread sheet exhibiting another associative relationship with said master process model", there is no teaching what so ever in Freilich, the User's Guide, nor Spence regarding a spread sheet exhibiting an associative relationship with a master process model. To support the rejection the Examiner relies on the Abstract of Spence citing "developing a comprehensive physical machining process simulation program based on a solid modeling kernel". However, Spence merely disclose modeling of the machining process, there is no disclosure of capturing manufacturing process rules in a spreadsheet, nor existence of an associative relationship between a master process model and the spreadsheet.

Therefore, because neither Freilich, the User's Guide, nor Spence disclose or teach one or more elements of the invention they cannot render Applicants' claims unpatentable. Thus, Claims 1, 60, 119, and 153 are allowable, the rejections are improper, and they should be withdrawn.

In addition, Claims 2 – 59, 61 – 118, 120 – 152, and 154 – 187 include the same limitations as Claims 1, 60, 119, and 153 respectively, each allowable claims, and therefore, are also allowable, and improperly rejected. Thus, the rejections of Claims 2 – 59, 61 – 118, 120 – 152, and 154 – 187 should be withdrawn. Moreover, Claims 2 – 59, 61 – 118, 120 – 152, and 154 – 187 are dependent from Claims 1, 60, 119, and 153 respectively, an allowable claim by reason of the arguments presented above, and therefore Claims 2 – 59, 61 – 118, 120 – 152, and 154 – 187 must also be allowable. Thus, Claims 2 – 59, 61 – 118, 120 – 152, and 154 – 187 are allowable, the rejections are improper, and they should be withdrawn.

With regard to Claims 13, and 32, Applicant respectfully contends that neither Freilich, the User's Guide, nor Spence teach or disclose each element of the invention. Specifically, contrary to the Examiner's assertions, neither Freilich, the User's Guide, nor Spence teach or disclose, "said extracts are used to generate manufacturing process sheets". The Examiner suggests that Solid Edge V6 page 90 "feature construction process", and also see Applicant's discussion at specification page 17 "In Unigraphics ® software, a Modeling Module includes software configured to handle the extraction process" and "snapshot" and "of the assembly of the master process model 20 in progress". Note that Spence's "solid modeling kernel" is equivalent to Freilich's CAD system, and exemplified by Solid Edge V6. Additionally, note that Spence's "physical machining" is equivalent to Freilich's CAM. Thus, Freilich term "CAD/CAMming" is implicitly teaching towards the integration of CAD and CAM, as expressly discussed in Spence.". None of the above relied upon support discloses the claimed element of "said extracts are used to generate manufacturing process sheets." Therefore, because neither Freilich, the User's Guide, nor Spence disclose or teach one or more elements of the invention they cannot render Applicants' claims unpatentable. Thus, Claims 13 and 32 are allowable, the rejections are improper, and they should be withdrawn.

With regard to Claims 14, and 33, Applicant respectfully contends that neither Freilich, the User’s Guide, nor Spence teach or disclose each element of the invention. Specifically, contrary to the Examiner’s assertions, neither Freilich, the User’s Guide, nor Spence teach or disclose, “said virtual blank is positioned and oriented relative to said coordinate system”. The Examiner suggests that Solid Edge V6 page 29 “Construction and reference elements help you to construct features... Reference elements are planes and axes used to define extents, centerlines, and so forth.” and page 96 “The types of reference planes are base, global, and local...” and page 28 “base feature”, and page 157 “The first part you place into an assembly is important. It serves as the foundation upon which the rest of the assembly will be built.” and page 178 “Capturing Design Intent....”. None of the cited references to the Users Guide specifically disclose the claimed elements, in particular, where, and between which, particular elements the associative relationships are to be established. Applicants appreciate that various modeling elements identified in the claims are, of course, disclosed in the User’s Guide. Each of the “elements” for generating models existed in numerous modeling software applications. However, such disclosures taught a methodology of generating a model vertically (e.g., with each of the features added exhibiting a dependency and/or subdependency from the base feature and other features. There is no teaching in the User’s Guide of arranging the various elements as the Applicants have claimed. Applicants once again stress that the claimed invention does not purport to establish new “elements” for generating models, but instead a wholly new methodology for employing the existing elements to construct a model in a highly beneficial and efficient manner. While the Examiner may have located a reference that discloses the existence of the various elements of the claims that reference does not teach those elements arranged as the Applicants have.

Furthermore, it is not the existence of the reference planes, (part of a coordinate system) and other modeling elements that the Applicants claim, but the arrangement and relationships between the elements. Additionally, the Examiner relies on page 178 where there is discussion of “Capturing Design Intent.” The cited reference merely provides suggestions as to important considerations with respect to assembly relationships without providing any teaching what so ever as to a methodology of modeling as the Applicants

have done. There is no specific teaching on the cited pages of a method of forming a model in accordance with the methodology claimed. Teaching some or all of the claim elements clearly does not rise to the level of anticipation. Disclosure that certain design considerations are important clearly does not rise to the level of and enabling teaching of how to perform the modeling. This disclosure of design considerations clearly is not equivalent to disclosing “said virtual blank is positioned and oriented relative to said coordinate system”. Therefore, because Solid Edge V6 User’s Guide does not disclose or teach each element of the invention nor does it provide sufficient teaching to enable one skilled in the art to practice that which it is suggested that it does teach, it cannot render the Applicants’ claims unpatentable. Thus, Claims 14 and 33 are allowable, the rejections are improper, and they should be withdrawn.

Moreover, the cited sections relied upon as support by the Examiner actually provide clear evidence of the existence of the inadequacies of the prior art. That is, the cited reference is a clear recognition that the existing modeling and assembly methods are highly vertical, and subject to the limitation that establishment of certain relationships would result in difficulties when modification were in order. Clearly, by the teachings of the references as applied it is apparent that the art was well aware of the current limitations of modeling by recognizing that the current art could result models where the establishment of certain relationships would result in difficulties when modification were in order. Advantageously, Applicants recognized this deficiency and their invention addresses this problem of the existing art by establishing a methodology for modeling that minimizes the impact of the difficulties that arise when modifications must be made. Once again, this recognition clearly indicates that the Applicants’ invention has not and cannot be rendered unpatentable by the cited reference. Therefore, because neither Freilich, the User’s Guide, nor Spence disclose or teach one or more elements of the invention they cannot render Applicants’ claims unpatentable. Thus, Claims 14 and 33 are allowable, the rejections are improper, and they should be withdrawn.

With regard to Claims 20, and 39, Applicant respectfully contends that neither Freilich, the User’s Guide, nor Spence teach or disclose each element of the invention. Specifically, contrary to the Examiner’s assertions, neither Freilich, the User’s Guide, nor

Spence teach or disclose, “said manufacturing instructions comprise process sheets”. The Examiner suggests that Solid Edge V6 page 90 “feature construction process” and by Spence at Abstract “developing a comprehensive physical machining process simulation program based on a solid modeling kernel”. Applicants respectfully submit that the Examiner is mischaracterizing the claimed invention and the cited references. None of the cited references or the reference to the Users Guide specifically disclose the claimed elements. In fact, the Users Guide page 90 includes no reference what so ever to manufacturing instructions or process sheets. The “feature construction process to which the Examiner refers includes no disclosure what so ever regarding manufacturing instructions and process sheets. Applicants respectfully direct the Examiners attention to the specification for teaching regarding process sheets. Therefore, because neither Freilich, the User’s Guide, nor Spence disclose or teach one or more elements of the invention they cannot render Applicants’ claims unpatentable. Thus, Claims 20 and 39 are allowable, the rejections are improper, and they should be withdrawn.

Applicants respectfully submit that the remaining rejections are comparably addressed by the arguments presented above. The Examiner states that “Claims 60-118 are “manufactured part created by the method” claims, with the same limitations “method” claims 1-59, and thus are rejected for the same reasons as claims 1-59.” Similarly, “Claims 119-152 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freilich in view of Solid Edge V6 and Spence. Claims 119-152 are “storage medium” claims, with the same limitations “method” claims 1-59, and are rejected for the same reasons. Claims 153-187 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freilich in view of Solid Edge V6 and Spence. Claims 153-187 are “computer data signal” claims, with the same limitations “method” claims 1-59, and are rejected for the same reasons.” Therefore the rejections of Claims 60-118, 119 – 152, and 153 – 187 are overcome by the arguments presented for Claims 1 – 59. Claims 1 – 59 are allowable for the reasons presented above, thus 60-118, 119 – 152, and 153 – 187 must also be allowable, the rejections are improper and they should be withdrawn.

The arguments and amendments presented herein are made for the purposes of better defining the invention, rather than to overcome the rejections for patentability. The

claims have not been amended to overcome the prior art and therefore, no presumption should attach that either the claims have been narrowed over those earlier presented, or that subject matter or equivalents thereof to which the Applicants are entitled has been surrendered. Allowance of the claims is respectfully requested in view of the above remarks. Moreover, no amendments as presented alter the scope of the claimed invention and therefore cannot necessitate a new grounds rejection.

It is believed that the foregoing remarks are fully responsive to the Office Action and that the claims herein should be allowable to the Applicant. In the event the Examiner has any queries regarding the instantly submitted response, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are additional charges with respect to this matter or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully Submitted,

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